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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,672	06/29/2006	Werner Bonrath	4662-189	4996
23117 7590 06/25/2010 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
KEYS, ROSALYND ANN				
ART UNIT		PAPER NUMBER		
1621				
MAIL DATE		DELIVERY MODE		
06/25/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/582,672

**Applicant(s)**

BONRATH ET AL.

**Examiner**

Rosalynd Keys

**Art Unit**

1621

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-10 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-10 and 13-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date 4/9/10
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 1, 3-10 and 13-20 are pending.  
Claims 1, 3-10 and 13-20 are rejected.  
Claims 2, 11, 12, 21 and 22 are cancelled.

### ***Response to Amendment***

2. The rejection of claims 1, 3-10 and 13-20 under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (US 6,444,841 B2); Vogel (US 3,654,192); Krill et al. (US 6,239,294 B1) and Schneider et al. (Applied Catalysis A: General 220 (2201), pp. 51-58) is withdrawn, due to the amendment to claim 1, filed April 8, 2010.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:  
  
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
  1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 3-10 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (US 6,444,841 B2) in view of Chauhan et al. (Synlett, 1999, No. 11 pp. 1743-1744); Krill et al. (US 6,239,294 B1) and Schneider et al. (Applied Catalysis A: General 220 (2201), pp. 51-58).

Takahashi et al. teach a process for the manufacture of 2,3,5-trimethylhydroquinone diester comprising reacting ketoisophorone with an acylating agent in the presence of an acid catalyst (e.g., a protonic acid catalyst or a Lewis acid catalyst (see entire disclosure, in particular col. 1, line 45 to col. 6, line 24 and claims 1, 5 and 6). Suitable acylating agents include acid anhydrides, acyl halide and enol esters (see col. 4, line 55 to col. 5, line 35). The amount of acylating agent is at least about two times mole and preferably about 3 to 10 times mole relative to a substrate represented by formula (3) (e.g., KIP) (see col. 5, lines 25-29). The reaction temperature is selected from the range of 0° to 150°C, preferably 10 to 120°C. usually about 50 to 110°C (see col. 6, lines 17-25).

Takahashi et al. differ from the instant claims in that although Takahashi et al. teach that Lewis acids can be utilized as the acid catalyst, Takahashi et al. do not specifically teach the use of indium triflate.

However, indium triflate is a well known Lewis acid (see for example column 1 on page 1743 of Chauhan et al.).

One having ordinary skill in the art at the time the invention was made would have found it obvious to utilize any well known Lewis acid in the process of Takahashi et al., including indium triflate as disclosed by Chauhan et al., since Takahashi et al. teach that Lewis acids can be utilized as the acid catalyst in their invention. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Further, the claims would have been obvious because "a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, 82 USPQ2d 1385, 1395-97 (2007).

Takahashi et al. further differ from the claims in that Takahashi et al. do not teach converting the obtained 2,3,5-trimethylhydroquinone diester into (all-rac)- $\alpha$ -tocopherol by transesterification to yield 2,3,5-trimethylhydroquinone and reaction of the latter with isophytol and/or phytol.

Krill et al. teach the production of mixture of  $\alpha$ -tocopherol/ $\alpha$ -tocopherol acetate by condensation of trimethylhydroquinone diacetate and isophytol (see col. 4, lines 12-24).

Schneider et al. teach production of (all-rac)-  $\alpha$ -tocopherol (acetate) directly from 2,3,5-trimethylhydroquinone diacetate with isophytol (IP) or saponification/transesterification to 2,3,6-trimethylhydroquinone monoacetate/2,3,5-trimethylhydroquinone followed by the reaction with IP (see page 52 col. 1).

One having ordinary skill in the art at the time the invention was made would be motivated to utilize the 2,3,5-trimethylhydroquinone diester product of Takahashi et al. to make

(all-rac)- $\alpha$ -tocopherol as disclosed by Krill et al. or Schneider et al., since  $\alpha$ -tocopherol and its derivatives are important as feed additives, as antioxidants, as agents for stimulating the blood circulation, as agents for retarding cell ageing and for related applications (see col. 1, lines 13-19).

### ***Response to Arguments***

7. Applicant's arguments filed April 8, 2010 have been fully considered but they are not persuasive.

It is noted that the Applicants believe that the use of indium triflate as the catalyst produces unexpected results. However, the results obtained by Applicants do not appear to be unexpected, since the reaction temperature (see col. 6, lines 17-25 of Takahashi et al.) and reaction time (see the table on page 6 of Applicants specification wherein when the claimed indium triflate also had a reduced yield when the reaction time was higher) affect the yield of the desired hydroquinone diesters. Thus, the results do not show that it is the use of an indium triflate catalyst that is critical to achieving higher yields and not the differences in the time and temperature. In particular since Takahashi et al. broadly disclose the use of a reaction temperature of 0 to 150°C (see col. 6, lines 17-25) and reaction times ranging from 2-15 hours (see the Examples). Thus, the Applicants should have compared the instantly claimed Lewis acid catalyst with the Lewis acid catalysts of Takahashi et al. (US 6,444,841) utilizing the same times and temperatures. Further, an affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. "The reason for requiring evidence in declaration or affidavit form is to obtain the assurances that any statements or representations made are correct, as provided by 35 U.S.C. 25 and 18 U.S.C. 1001."

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosalyn Keys whose telephone number is (571)272-0639. The examiner can normally be reached on M-F 5:30 am-7:30 am and 9:15 am-3:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rosalynd Keys/  
Primary Examiner, Art Unit 1621